

Approved by _____ date _____

NOTICE: This document addresses Payload Pressure Vessel Certification efforts. This document cancels and replaces Operations Policy No. 04-09-01: **DOCUMENT FOLLOWS:**

Payload Pressure Vessels Certification

1. Introduction

NSBF mechanical engineers routinely evaluate the design and fabrication of payload gondolas for safety prior to flight. This evaluation leads to an internal certification of the gondola that becomes a permanent part of the flight record. The evaluation and certification of payload pressure vessels previously was performed by the Balloon Program Office (BPO). BPO mechanical engineers would evaluate documentation supplied by individual science groups that provided data on pressure vessel design, material specifications, fabrication, flight history, and, testing history. The BPO evaluation would result in a memorandum certification retained in BPO flight history files.

A recent catastrophic failure of a payload pressure vessel has served to emphasize the flight safety evaluation of pressure vessels, as well as highlighting the requirement to evaluate the payload as a total entity for flight safety purposes. As a part of the corrective action initiative, the pressure vessel certification responsibility has devolved to NSBF. The following paragraphs will discuss the implementation the certification procedures that will be employed by NSBF.

2. Payload Gondola Certification Procedures

Pressure vessel certification is a new responsibility. It will be performed in addition to the current gondola certification process. Existing gondola certification procedures are neither modified nor superseded.

3. Implementation

Payload pressure vessel certification will be performed by the Mechanical Engineering Section. Responsible personnel will be assigned to evaluate individual payloads as required.

Individual science group Principal Investigators will continue to be responsible for the design, fabrication and testing of all pressure vessels associated with their payloads. Test programs must be performed to the extent necessary to demonstrate that the pressure vessel(s) will not present an unacceptable risk to personnel or property as a consequence of ground or flight operations.

As a part of the annual Candidate Flight Program formulation process, individual science group Principal Investigators will be requested to supply the information listed below as a part of their flight application.

Design pressure analysis showing maximum design pressure(s).

Normal operating pressure for ground and flight operations.

Overview of material and construction specifications.

Pressure test dates, methodology, and results.

Past flight history of the pressure vessels.

The certifying mechanical engineer will review the flight application for the presence and adequacy of the preceding documentation requirements. The Operations Department Head or applicable Campaign Manager will coordinate obtaining any missing or inadequate information from the applicable Principal Investigator.

Based on the information supplied, the certifying mechanical engineer will determine whether or not the operation of the payload pressure vessel will present an unacceptable ground or flight safety risk. The emphasis of the process will be on determining the possibility of significant structural failures. Determining minor failure modes that could result only in possible science degradations are not within the purview of this process.

If the certifying mechanical engineer determines that the payload pressure vessel(s) do not present unacceptable safety risks, the engineer will draft and forward to the Operations Department Head a memorandum certification, stating approval for flight operations. The memorandum will be made a permanent part of the flight record retained by NSBF.